

## First Galileo Images of Io

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During the Ganymede-1 encounter the Solid State Imaging (SSI) experiment on Galileo returned 3 sets of 4-color full-disk images of Io at moderate phase angles, 2 sets of 3-color high-phase crescent images, and a clear-filter (0.4-1.0 um) eclipse image with Io in Jupiter's shadow. The full-disk images cover about 75% of Io's surface; the remaining area is expected to be imaged during the Ganymede-2 encounter in early September. Many surface changes are apparent compared to Voyager images. The most dramatic changes are new flows and pyroclastic deposits surrounding Ra Patera and Marduk, new pyroclastics near Euboea Fluctus, and about 10 smaller (100-km) changes. The bright yellow flows and absence of intense hot spots at Ra Patera and Marduk are consistent with sulfur flows. In contrast, surface changes are much more subtle near the persistent high-temperature hot spots Loki and Kanehikili, perhaps dominated by silicate volcanism. The Loki plumes were inactive. Several regions that changed between Voyagers 1 and 2, such as Surt and Aten, now appear similar to the Voyager 1 images. Processes such as phase transformations or sublimation must alter certain deposits such as reddish plume fallout and dark caldera floor materials over timescales of years to decades. Io's reddish polar regions may be due to red pyroclastics that transform or sublimate more slowly in the colder polar regions. The eclipse image reveals at least 7 hot spots: Pele, Marduk, Volund, Reiden Patera, and 3 hot spots in NW Colchis Regio. The Pele hot spot is more than 100 times more intense than the others, perhaps due to very active silicate volcanism. A new active plume was discovered at Ra Patera, which was also found to fluoresce in the red bandpass, perhaps due to neutral oxygen. The eclipse image also reveals auroral glows near Ra, Volund, and a thin atmospheric layer outlining the limb on Io's leading hemisphere (magnetospheric wake region). No evidence for stealth plumes is seen in the eclipse image, but Pele may have been active with a barely-detectable plume seen on the bright limb.

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